

CLAIMS

What is claimed is:

1. A system for powering an at least one electrical device in a truck with an engine while the truck's engine is turned off, the system comprising:

a primary power supply comprising an alternator and an at least one battery of the truck;

a secondary power supply;

an auxiliary power storage means for storing power comprising an at least one auxiliary power storage unit;

a first operating circuit connecting the primary power supply to the auxiliary power storage means, comprising a first switching means for selectively actuating the first operating circuit to direct power from the primary power supply to charge the at least one power storage unit of the auxiliary power storage means while the truck's engine is turned on;

a second operating circuit connecting the secondary power supply to the auxiliary power storage means, comprising

a first circuit breaker;

a second switching means for selectively actuating the second operating circuit to direct power from the secondary power supply to charge the at least one power storage unit of the auxiliary power storage means; and,

a third operating circuit connecting the auxiliary power storage means to an at least one electrical outlet in the truck, comprising

the at least one electrical outlet into which the at least one electrical device may be plugged; and,

a third switching means for selectively actuating the third operating circuit to direct power from the auxiliary power storage means to the at least one electrical outlet;

wherein a system is provided to safely and efficiently capture power being generated by the primary and secondary power supplies, to store the captured power in the auxiliary power storage means, and to maintain the charge of the at least one auxiliary power storage units by using the secondary power supply when the primary power supply is turned off so as to enable the at least one electrical device to run on power generated by the secondary power supply or stored in the at least one auxiliary power storage unit over an extended period of time while the truck is turned off without depleting the charge of the at least one auxiliary power storage unit and while minimizing stress on the secondary power supply.

2. The system of Claim 1, wherein the secondary power supply is a powered refrigeration unit mounted on a trailer being hauled by the truck.
3. The system of Claim 1, wherein the at least one power storage unit of the auxiliary power storage means comprises an at least one deep-cycle battery.
4. The system of Claim 1, wherein the second switching means of the second circuit comprises:
 - a primary switching means for actuating the second operating circuit;
 - a first control switch operatively interconnected with the primary switching means for actuating the primary switching means; and,
 - a second remote switch operatively interconnected with the first control switch for selectively actuating the first control switch and thereby the primary switching means to actuate the second operating circuit.
5. The system of Claim 4, wherein the second switching means further comprises:
 - a second normally closed control switch operatively interconnected with the second remote switch and the first control switch to transmit power between the two switches; and,
 - a temperature controlled switching means for opening the normally closed second control switch when an interior temperature of the truck requires heating or cooling by one of the at least one electrical devices that is a high-amperage device, and for thereby disconnecting said high-amperage electrical device from the secondary power supply and directing power

to said high-wattage electrical device from the at least one auxiliary power storage unit only.

6. The system of Claim 1, wherein the third operating circuit further comprises an inverter means operatively interconnected with the auxiliary power storage means and the at least one electrical outlet for converting direct current from the auxiliary power storage means to alternating current.

7. A system for powering an at least one electrical device in a truck with an engine while the truck's engine is turned off, the system comprising:

a primary power supply comprising an alternator and an at least one battery of the truck;

a secondary power supply located on a trailer being hauled by the truck and comprising an alternator and an at least one battery;

an auxiliary power storage means for storing power comprising an at least one auxiliary power storage unit;

a first operating circuit operatively connecting the primary power supply to the auxiliary power storage means, comprising

a first switching means for actuating the first operating circuit to direct power from the primary power supply to charge the at least one power storage unit of the auxiliary power storage means while the truck's engine is turned on; and

a first remote switch operatively interconnected with the first switching means for selectively actuating the first switching means;

a second operating circuit connecting the secondary power supply to the auxiliary power storage means, comprising

a first connecting means connected to the at least one battery of the secondary power supply for connecting the secondary power supply to the auxiliary power storage means via a second connecting means to which the first connecting means is removably connected;

the second connecting means connected to the auxiliary power storage means for connecting the auxiliary power storage means to the secondary power supply via the first connecting means to which the second connecting means is removably connected;

a first circuit breaker located between the secondary power supply and the auxiliary power supply, the first circuit breaker having a trip amperage less than the rated amperage output of the alternator of the secondary power supply;

a second switching means for selectively actuating the second operating circuit to direct power from the secondary power supply to charge the at least one power storage unit of the auxiliary power storage means, comprising

- a primary switching means for actuating the second operating circuit;
- a first control switch operatively interconnected with the primary switching means for actuating the primary switching means; and,
- a second remote switch operatively interconnected with the first control switch for selectively actuating the first control switch and thereby the primary switching means to actuate the second operating circuit; and,

a third operating circuit connecting the auxiliary power storage means to an at least one electrical outlet in the truck, comprising

- a second circuit breaker;
- the at least one electrical outlet into which the at least one electrical device may be plugged; and,
- a third remote switch for selectively actuating the third operating circuit to direct power from the auxiliary power storage means to the at least one electrical outlet;

wherein a system is provided to safely and efficiently capture power being generated by the primary and secondary power supplies, to store the captured power in the auxiliary power storage means, and to maintain the charge of the at least one auxiliary power storage units by using the secondary power supply when the primary power supply is turned off so as to enable the at least one electrical device to run on power generated by the secondary power supply or stored in the at least one auxiliary power storage unit over an extended period of time while the truck is turned off without depleting the charge of the at least one auxiliary power storage unit and while minimizing stress on the secondary power supply.

8. The system of Claim 7, wherein the secondary power supply is a powered refrigeration unit mounted on the trailer.
9. The system of Claim 7, wherein the at least one power storage unit of the auxiliary power storage means comprises an at least one deep-cycle battery.
10. The system of Claim 7, wherein the first and second connecting means each comprise a pair of electrical cables one end of each connecting to the secondary power supply and the auxiliary power storage means, respectively, and the other end of each comprising a one-way connector to enable a removable connection there between.
11. The system of Claim 7, wherein the second operating circuit further comprises a third connecting means inserted between and removably connecting the first and second connecting means.
12. The system of Claim 7, wherein the at least one electrical device is a device that operates on direct current.
13. The system of Claim 7, wherein the second switching means of the second circuit further comprises:
 - a second normally closed control switch operatively interconnected with the second remote switch and the first control switch to transmit power between the two switches; and,
 - a temperature controlled switching means for opening the normally closed second control switch when an interior temperature of the truck requires heating or cooling by one of the at least one electrical devices that is a high-amperage device, and for thereby disconnecting said high-amperage electrical device from the secondary power supply and directing power to said high-wattage electrical device from the at least one auxiliary power storage unit only.

14. The system of Claim 7, wherein the third operating circuit further comprises an inverter means operatively interconnected with the auxiliary power storage means and the at least one electrical outlet for converting direct current from the auxiliary power storage means to alternating current and wherein the at least one electrical device is a device that operates on alternating current.

15. The system of Claim 14, wherein the inverter means comprises an electrical plug to enable input of power from an external alternating current power supply.

16. A system for powering an at least one electrical device in a truck with an engine while the truck's engine is turned off, the system comprising:

a primary power supply comprising an alternator and an at least one battery of the truck;

a secondary power supply located on a trailer being hauled by the truck and comprising an alternator and an at least one battery;

an auxiliary power storage means for storing power comprising an at least one auxiliary power storage unit;

a first operating circuit connecting the primary power supply to the auxiliary power storage means, comprising

a first switching means for actuating the first operating circuit to direct power from the primary power supply to charge the at least one power storage unit of the auxiliary power storage means while the truck's engine is turned on; and
a first remote switch operatively interconnected with the first switching means for selectively actuating the first switching means;

a second operating circuit connecting the secondary power supply to the auxiliary power storage means, comprising

a first connecting means connected to the at least one battery of the secondary power supply for connecting the secondary power supply to the auxiliary power

storage means via a second connecting means to which the first connecting means is removably connected;

the second connecting means connected to the auxiliary power storage means for connecting the auxiliary power storage means to the secondary power supply via the first connecting means to which the second connecting means is removably connected;

a first circuit breaker located between the secondary power supply and the auxiliary power supply, the first circuit breaker having a trip amperage less than the rated amperage output of the alternator of the secondary power supply;

a second switching means for selectively actuating the second operating circuit to direct power from the secondary power supply to charge the at least one power storage unit of the auxiliary power storage means, comprising

- a primary switching means for actuating the second operating circuit;
- a first control switch operatively interconnected with the primary switching means for actuating the primary switching means; and,
- a second remote switch operatively interconnected with the first control switch for selectively actuating the first control switch and thereby the primary switching means to actuate the second operating circuit;
- a second normally closed control switch operatively interconnected with the second remote switch and the first control switch to transmit power between the two switches; and,
- a temperature controlled switching means for opening the normally closed second control switch when an interior temperature of the truck requires heating or cooling by one of the at least one electrical devices that is a high-amperage device, and for thereby disconnecting said high-amperage electrical device from the secondary power supply and directing power to said high-wattage electrical device from the at least one auxiliary power storage unit only; and,

a third operating circuit connecting the auxiliary power storage means to an at least one electrical outlet in the truck, comprising

- a second circuit breaker located between the at least one electrical outlet and the auxiliary power supply;

the at least one electrical outlet into which the at least one electrical device may be plugged;

an inverter means operatively interconnected with the auxiliary power storage means and the at least one electrical outlet for converting direct current from the auxiliary power storage means to alternating current;

a third remote switch for selectively actuating the third operating circuit to direct power from the auxiliary power storage means via the inverter means to the at least one electrical outlet in the form of alternating current;

wherein a system is provided to safely and efficiently capture power being generated by the primary and secondary power supplies, to store the captured power in the auxiliary power storage means, and to maintain the charge of the at least one auxiliary power storage units by using the secondary power supply when the primary power supply is turned off so as to enable the at least one electrical device to run on power generated by the secondary power supply or stored in the at least one auxiliary power storage unit over an extended period of time while the truck is turned off without depleting the charge of the at least one auxiliary power storage unit and while minimizing stress on the secondary power supply, particularly when the at least one electrical device is a heater or cooler.

17. The system of Claim 16, wherein the second operating circuit further comprises a third connecting means inserted between and removably connecting the first and second connecting means.

18. The system of Claim 16, wherein the inverter means comprises an electrical plug to enable input of power from an external alternating current power supply.

19. A method for powering an at least one electrical device in a truck with an engine while the truck's engine is turned off, the method comprising:

providing a primary power supply comprising an alternator and an at least one battery of the truck;

providing a secondary power supply located on a trailer being hauled by the truck and comprising an alternator and an at least one battery;

providing an auxiliary power storage means for storing power comprising an at least one auxiliary power storage unit;

providing a first operating circuit operatively connecting the primary power supply to the auxiliary power storage means, comprising

- a first switching means for actuating the first operating circuit to direct power from the primary power supply to charge the at least one power storage unit of the auxiliary power storage means while the truck's engine is turned on; and
- a first remote switch operatively interconnected with the first switching means for selectively actuating the first switching means;

providing a second operating circuit connecting the secondary power supply to the auxiliary power storage means, comprising

- a first connecting means connected to the at least one battery of the secondary power supply for connecting the secondary power supply to the auxiliary power storage means via a second connecting means to which the first connecting means is removably connected;

- the second connecting means connected to the auxiliary power storage means for connecting the auxiliary power storage means to the secondary power supply via the first connecting means to which the second connecting means is removably connected;

- a first circuit breaker located between the secondary power supply and the auxiliary power supply, the first circuit breaker having a trip amperage less than the rated amperage output of the alternator of the secondary power supply;

- a second switching means for selectively actuating the second operating circuit to direct power from the secondary power supply to charge the at least one power storage unit of the auxiliary power storage means, comprising

- a primary switching means for actuating the second operating circuit;

- a first control switch operatively interconnected with the primary switching means for actuating the primary switching means; and,

a second remote switch operatively interconnected with the first control switch for selectively actuating the first control switch and thereby the primary switching means to actuate the second operating circuit;

providing a third operating circuit connecting the auxiliary power storage means to an at least one electrical outlet in the truck, comprising

a second circuit breaker;
the at least one electrical outlet into which the at least one electrical device is plugged; and,
a third remote switch for selectively actuating the third operating circuit to direct power from the auxiliary power storage means to the at least one electrical outlet;

removably connecting the first and second connecting means;

turning on the secondary power supply;

actuating the first operating circuit by means of the first remote switch when the truck's engine is turned on to direct power from the primary power supply to the at least one auxiliary power storage unit and deactuating the first operating circuit when the truck's engine is turned off;

selectively actuating the second operating circuit by means of the second remote switch to direct power from the secondary power supply to the at least one auxiliary power storage unit; and,

selectively actuating the third operating circuit by means of the third remote switch, to direct power to the at least one electrical outlet from the auxiliary power storage means and the secondary power supply;

whereby a method is provided for safely and efficiently capturing power being generated by the primary and secondary power supplies, for storing the captured power in the auxiliary power storage means, and for maintaining the charge of the at least one auxiliary power storage units by using the secondary power supply when the primary power supply is turned off so as to enable the

at least one electrical device to run on power generated by the secondary power supply or stored in the at least one auxiliary power storage unit over an extended period of time while the truck is turned off without depleting the charge of the at least one auxiliary power storage unit and while minimizing stress on the secondary power supply.

20. The method of Claim 19, further comprising providing a third connecting means in the second circuit inserted between and removably connecting the first and second connecting means, and wherein removably connecting the first and second connecting means further comprises removably inserting the third connecting means there between so that the first and second connecting means are connected via the third intermediate connecting means.

21. The method of Claim 19, wherein the second switching means of the second circuit further comprises:

a second normally closed control switch operatively interconnected with the second remote switch and the first control switch to transmit power between the two switches; and,
a temperature controlled switching means for opening the normally closed second control switch when an interior temperature of the truck requires heating or cooling by one of the at least one electrical devices that is a high-amperage device, and for thereby disconnecting said high-amperage electrical device from the secondary power supply and directing power to said high-wattage electrical device from the at least one auxiliary power storage unit only.

22. The method of Claim 19, wherein the third operating circuit further comprises an inverter means operatively interconnected with the auxiliary power storage means and the at least one electrical outlet for converting direct current from the auxiliary power storage means to alternating current and wherein the at least one electrical device is a device that operates on alternating current.

23. The method of Claim 19, wherein the inverter means comprises an electrical plug to enable input of power from an external alternating current power supply.

24. The method of Claim 23, further comprising connecting the electrical plug to the external alternating current power supply.